REMARKS

The Office Action dated June 3, 2005 has been carefully reviewed. Claims 1-6 are pending. Reconsideration of the grounds of rejection is respectfully requested in view of the remarks herein.

Summary of the Office Action

References to paragraphs in the subject office action are referred to herein in parentheses identifying the appropriate paragraph, e.g. (para x).

The Examiner has indicated that claims 1-4 and 6 contain allowable subject matter.

Claim 5 is rejected under 35 U.S.C. 102(e) as being anticipated by Werner et al., US Pub. 2003/0034918 ("Werner") (para 2).

Summary of the Office Action

A. Claims 1-4 and 6

The Applicants note with appreciation the Examiner's finding that claims 1-4 and 6 contain allowable subject matter.

B. Rejection of claim 5

The Examiner has rejected claim 5 under 35 U.S.C. 102(e) as being anticipated by "Werner." In response to the Examiner's rejection of claim 5, the Applicants respectfully submit that Werner fails to disclose each and every limitation of claim 5. "A claim is anticipated only if each and every element as set forth in the claims is found, either expressly or inherently described, in a single prior art reference." *Verdegaal Bros. v. Union Oil Co. of California,* 814 F.2d 628, 631 (Fed. Cir. 1987).

Claim 5 provides for a method for rapid radiation pattern formation of a fractile array, comprising the steps of: a) employing a pattern multiplication for fractile arrays, comprising: deriving a product formulation for the radiation pattern of a fractile array for a desired stage of growth; b) recursively applying step (a) to construct higher order fractile arrays; and c) forming an antenna array based on the results of step (b). The Applicants respectfully submit Werner fails to teach the underlined claim elements as set forth above.

Werner describes the construction of single antenna elements having a fractal shape through an iterative building process. These fractal antenna elements may be placed in an array by selecting a randomly selected pattern. ¶ [0078].

As described in the earlier Response to Office Action, the disclosure of Werner is not the same as the present invention providing for a "fractile array." The Applicants have acted as their own lexicographer in defining the term "fractile" array "as an array with a fractal boundary contour that tiles the plane without leaving any gaps or without overlapping, wherein the fractile array illustrates improved broadband characteristics." The fractile array may be envisioned as an array of self-similar, repeated fractal-shaped units of tiles covering a plane or a portion of a plane without gaps or overlaps with single antenna elements distributed throughout the fractile array. The fractile array maybe generated by successive stages of growth starting from a first fractal-shaped unit. The Examiner is directed to Figures 11A-11C of the present invention. The initial fractal-shaped Gosper island is shown in Figure 11A. This initial array, in the shape of a Gosper island, maybe considered a "tile." In Figure 11B, the tile, in the form of the Gosper island, has repeated itself so that the fractile array is composed of seven identical Gosper islands. In Figure 11C, the tile has repeated itself again so the fractile array is composed of many identical Gosper

islands. Single antenna elements are distributed evenly throughout the fractile array. These single antenna elements may or may not have a fractal shape.

Regarding the claims limitation of "employing a pattern multiplication for fractile arrays," the Examiner has cited to Figures 1-47 as disclosing the claim limitation of "employing a pattern multiplication for fractal arrays." The Applicants respectfully submit Figures 1-47 each illustrate a single antenna element having a fractal shape built through an iterative process. For example, Figure 2 illustrates the stages of Koch curve generation using an iterative function. In A_0, the curve has a shape which is repeated in segments w_1, w_2, w_3, and w_4 to form A_1. This iterative process is then repeated to form A_2 and A_3.

The Applicants respectfully submit that "pattern multiplication" is not the same as an iterative process to design the shape of a single antenna. For traditional antenna arrays, the total antenna array radiation pattern is determined by pattern multiplication calculation which is the product of the radiation of a single element and the radiation of the array pattern. In the case of a "fractile array," "employing a pattern multiplication for fractile arrays" refers to the algorithm used to calculate the total array radiation pattern of a "fractile array."

With regards to the claim limitation of "deriving a product formulation for the radiation pattern of a fractile array for a desired stage of growth," the Examiner has cited to Figures 1 and 3 and paragraphs [0047]-[0049]. The Applicants respectfully submit that Figures 1 and 3 each illustrate a single antenna having a fractal shape with increasing complexity and not a fractile array. Paragraphs [0047]-[0049] describe the construction of a Koch curves, wherein each stage has increasing complexity but the same original pattern. The Applicants submit this has no relationship to determining the product formulation of the radiation pattern for a fractile array. There is nothing in the cited section of Werner which describes determining the product

formulation of an antenna array let alone a "fractile array." The Applicants refer to page 7, line 15 through page 9, line 10, of the specification where the product formulation of a radiation pattern for a fractile array is described for the present invention.

With regards to the claim limitation of "recursively applying step (a) to construct higher order fractile arrays," the Examiner has cited Figures 1, 2 and 45 and paragraphs [0049] and [0078]. As described above, Figures 1 and 2 and paragraph [0049] describe the construction of a single antenna having a fractal shape built through an iterative process. Figure 45 and paragraph [0078] describes the construction of a configuration of antenna elements within an antenna or antennas elements within an array. These elements may be placed in the antenna or array by selecting a randomly selected pattern. In Werner, the antenna elements themselves may have a fractal geometry but the placement of the elements within the configuration is not dependent upon the final array geometry. Therefore in cited section of Werner, it is not possible to derive a product formulation for the radiation pattern of the resulting array geometry for a desired stage of growth, since the antenna elements are not arranged according to a fractile array geometry.

Lastly with regards to the claim limitation of "forming an antenna array based on the results of step (b)," the Examiner has cited Figures 1, 2 and 45, paragraphs [0050] and [0078] to [0083]. As described above, Figures 1 and 2 illustrate the construction of single antenna elements having fractal shapes. Figure 45 and paragraphs [0078] – [0083] disclose the construction of a configuration of antenna elements within an antenna or antennas elements within an array. These cited section of Werner are not the same as a fractile array which is array comprised of self-similar, repeated fractal shaped tiles having antenna elements placed within the plane of the array.

Werner, therefore, fails to disclose each and every limitation of claim 5.

CONCLUSION

The Applicants respectfully request reconsideration and withdrawal of the rejection under 35 U.S.C. § 102(e) presented in the Office Action mailed June 3, 2005. The Examiner is invited to contact the undersigned at 215-963-5055 to discuss any matter concerning this Application.

The Commissioner is hereby authorized by this paper to charge any fees due in connection with the filing of the response to Deposit Account No. **50-0310**.

Respectfully submitted,

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Date

By: _____

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